REMARKS

Claim rejections under 35 USC 101

Claims 19-30 have been rejected under 35 USC 101 because they are not limited to tangible embodiments. Applicant has cancelled claims 22, 24, 28, and 30. Applicant has further amended claims 19 and 25, from which claims 20-21, 23, 26-27, and 29 ultimately depend, so that these claims are limited to "a tangible recordable data storage medium." Support for this amendment is found in the patent application as originally filed in two ways. First, claims 22 and 28 were originally presented as limiting the medium in question to a "recordable data storage medium." Second, as admitted by the Examiner, the specification as originally filed on page 7, lines 10-19 defines media as including both tangible and intangible embodiments. Applicant therefore submits that claims 19-21, 23, 25-27, and 29 now satisfy 35 USC 101.

Claim rejections under 35 USC 112

Claims 1-30 have been rejected under 35 USC 112, second paragraph, as being indefinite, due to the inclusion of the term "directly." That is, the Examiner states that it is unclear what qualifies as "directly" communicating. Applicant makes two comments. First, this rejection is appropriate only as to claims 1-3 and 7-15, since these are the only claims that include the term "directly." Second, and therefore, Applicant has amended independent claims 1 and 7, from which claims 2-3 and 8-15 ultimately depend, so that inclusion of this term is made clear – that communication between first and second hosts via a storage area network protocol is made "without passing through a storage device." For instance, Applicant refers the Examiner to FIG. 3 of the patent application as filed. In this figure, hosts 14 and 15 can communicate directly with one another by passing through the storage area network 17, without passing through any of the storage devices 16. Applicant submits that claims 1-3 and 7-15 as amended are not indefinite under 35 USC 112, second paragraph.

Claim rejections under 35 USC 103

Claims 1-30 have been rejected under 35 USC 103(a) as being unpatentable over Wilson (6,718,347) in view of Latif (6,400,730). Applicant respectfully traverses this rejection, as is now discussed in detail. Applicant treats claim 1 as representative of the claimed invention in this respect.

What the claimed invention is directed to

The claimed invention novelly uses a storage area network (SAN) for communication between two hosts (i.e., not between a host and a storage device). Thus, claim 1 is limited to means for communicating between each of a first host and a second host and a storage area network using a storage area network protocol, and further (and most importantly) means for communicating directly between the first and second hosts using a storage area network protocol. The idea here is that a SAN is used not only for host-to-storage device communication, but is also used for host-to-host communication.

To better illustrate this, the Examiner is referred to FIGs. 1-3 of the patent application as filed. In FIG. 1, a typical SAN in accordance with the prior art is shown. Hosts 1 and 2 communicate over the SAN 5 with the storage devices 6, but cannot communicate with one another over the SAN 5, as is customary. For host-to-host communication to occur, what is typically accomplished in the prior art is what is shown in FIG. 2. In FIG. 2, there is one network 10 for the host 8 to communicate with the host 9, and then there is a SAN 11 so that the hosts 8 and 9 can communicate with the storage devices 12. That is, there are two networks: the network 10, and the SAN 11. Applicant asks that the Examiner keep FIG. 2 in mind, as it will be important in understanding why Wilson in view of Latif does not render the claimed invention unpatentable.

Finally, we get to FIG. 3 of the patent application as filed. In FIG. 3, hosts 14 and 15 can communicate with the storage devices 16 over the SAN 17, but very importantly, can communicate with one another via the SAN 17. This is the crux of the invention insofar as patentability over Wilson in view of Latif is concerned. What Applicant is claiming, in other words, is that two hosts can communicate with each other directly, using a storage area network protocol, over a storage area network. An additional network, like the network 10 of FIG. 2, is not needed by the invention.

What Wilson in view of Latif teaches

Applicant next focuses attention to Wilson in view of Latif. It is noted that Wilson is primarily relied by the Examiner upon to teach all aspects of the claimed invention, except for the "non-ESCON protocol manner," for which reliance was made on Latif. Applicant focuses here on why the prior art does not teach host-to-host communication over a storage area network using a storage area network protocol. The Examiner relied upon Wilson in teaching these aspects of the claimed invention, and therefore Applicant primarily discusses Wilson in explaining why Wilson in view of Latif does not render the claimed invention non-patentable. Stated another way, Applicant discusses Wilson here because Wilson is relied upon as showing those aspects of the claimed invention that Applicant believes are not actually in the prior art. Applicant understands that the claimed invention has been rejected under 35 USC 103(a) as to Wilson in view of Latif, and it should be kept in mind at all times that Applicant is indeed traversing an obviousness-type rejection, and not, for instance, an anticipation rejection.

Let us step through the various parts of Wilson now. FIG. 2 of Wilson shows prior art, in which there is a network 114 connecting hosts 100a and 100b, to which storage devices 118a and 118b. Wilson therefore recognizes that using a storage area network (SAN) between the storage systems 118a and 118b would provide better performance for inter-storage system communication. Thus, in FIG. 3 of Wilson, what you see is that storage systems 118a and 118b

are connected via a dedicated communications link 304. Importantly, however, there is still a network 114 for connecting the hosts 100a and 100b together. That is, the servers 100a and 100b do not communicate over the dedicated communications link 304, but rather still communicate over the network 114. (Indeed, it would not make any sense for the hosts 100a and 100b to communicate over the dedicated communications link 304, since they would have to go through the storage systems 118a and 118b to do so, instead of directly going over the network 114.)

Now, the only mention of a SAN in Wilson is with reference to FIG. 6. In FIG. 6, Wilson shows ESCON interface units 608a and 608b making up the dedicated communication link 304 between the storage systems 118a and 118b. Although Wilson does not actually use the terminology "storage area network" anywhere, one of ordinary skill within the art would appreciate that the utilization of ESCON interface units 608a and 608b within a dedicated communication link 304 between two storage systems 118a and 118b makes the link 304 a SAN. In FIG. 6, however, there is still the network 114 by which the hosts 100a and 100b communicate with one another. That is, in the only embodiment of Wilson in which a SAN is disclosed, FIG. 6, the hosts 100a and 100b do not communicate over the SAN implementation of the dedicated communications link 304, but rather over a different network 114. (Again, it would not make any sense for the hosts 100a and 100b to communicate over the dedicated communications link 304 in FIG. 6, since they would have to go through the storage systems 118a and 118b to do instead.)

Therefore, what Wilson, and thus Wilson in view of Latif, teaches is that you have one network for host-to-host communication, and another dedicated communications link, such as a SAN, for storage systems/devices to communicate with one another. Wilson does not teach host-to-host communication over a SAN, as to which the claimed invention is novelly limited. For this reason, Wilson in view of Latif does not render the claimed invention non-patentable.

Specific refutation of the Examiner's arguments

The Examiner, however, does make a strong case that Wilson, and thus Wilson in view of Latif, teaches host-to-host communication over a storage-area network (SAN) using a SAN protocol. Applicant nevertheless believes that if you examine Wilson closely, and interpret Wilson in light of its explicit statements and the knowledge of one of ordinary skill within the art, you come to the conclusion that Wilson does not teach inter-host communication over a SAN. The Examiner primarily relies upon FIGs. 12, 13, and 16 of Wilson. We focus here on FIG. 12, because FIG. 13 does not actually show any type of inter-host communication, and FIG. 16 still shows a separate network 1613 for the two hosts 1601 and 1607 over which to communicate, and a dedicated communications link 1615, like a SAN, for the two storage systems 1603 and 1609 over which to communicate. That is, FIG. 13 of Wilson is not directed towards any type of inter-host communication, and FIG. 16 shows a separate network for inter-host communication apart from a network that is used for inter-storage system communication.

FIG. 12, however, is more troublesome, in that it seemingly shows what Applicant has stated is a novel aspect of the claimed invention, namely, inter-host communication directly over a SAN. Let us then step through FIG. 12. In FIG. 12, the same communications link 304 is used for the storage systems 118a and 118b to communicate with one another, and for the hosts 100a and 100b to communicate with one another. Thus, Applicant concedes that Wilson is a strong reference over which to reject the claimed invention in combination with other references (e.g., Latif), because it would seem evident that the embodiment of FIG. 6 of Wilson, in which the communications link 304 can be a SAN, could be used to implement the communications link 304 in the embodiment of FIG. 12, where inter-host communication does indeed occur over the communications link 304. However, Applicant believes that if you carefully examine Wilson, and reasonably interpret Wilson as one of ordinary skill within the art would, you still come to the conclusion that Wilson does not teach inter-host communication over a SAN.

Applicant's primary argument is this: FIG. 12 of Wilson does not teach that the communications link 304 can be a SAN, insofar as the specific embodiment of FIG. 12 of Wilson is concerned (and which is the only embodiment in Wilson that could potentially in combination with other references like Latif could read on the claimed invention). As has been stated above, FIG. 6 is the only embodiment in Wilson in which SAN-type technology – e.g., ESCON interface units – is disclosed, and FIG. 6 shows a network 114 for inter-host communication that is separate from the dedicated communications link 304 that in FIG. 6 can use SAN technology. Therefore, the question is, can you reasonably insert the SAN-type technology (ESCON interface units) of the embodiment of FIG. 6, which employs two separate networks, into the embodiment of FIG. 12, which employs a single network? If the answer is yes, then Wilson in view of Latif renders the claimed invention unpatentable.

However, Applicant believes that the correct answer is no. Let us first look at the explicit evidence found in Wilson itself. In describing its FIG. 12, Wilson states that "[i]n contrast to a dedicated ESCON link . . . the network cloud 1206 of the FIG. 12 embodiment is a resource that typically is shared by the storage controllers 302a-b and one or more other users 116a-b." (Col. 28, ll. 51-56) This is a significant pronouncement. Wilson is saying that in the embodiment of FIG. 12, SAN-type technology, like ESCON links, is not to be used to implement the network cloud 102 of the communications link 304. That is, *in contrast to a dedicated ESCON link* (i.e., a network using SAN-type technology, like a SAN), the network cloud 1206 that implements the communications link 304 in FIG. 12 *is a resource that typically is shared* by the storage systems and the hosts. Thus, insofar as the only time Wilson touches on SAN-type technology is to disclose ESCON links, Wilson's statement that such SAN-type technology is not to be used to implement the embodiment of FIG. 12 teaches away from the claimed invention. That is, where there is a central network over which both storage systems 118a and 118b communicate, and over which hosts 100a and 100b communicate, the network is not a SAN, Wilson says, because Wilson informs us that SAN-type technology is not to be employed. Indeed, the examples that Wilson

recites as being able to implement the link 304 in FIG. 12 are the Internet (col. 28, ll. 57-63) and an intranet or other private network (col. 29, ll. 8-10). These are not SAN's, as can be appreciated by those of ordinary skill within the art.

Admittedly, this pronouncement of Wilson is not a slam-dunk statement that would settle the issue for all doubters. Therefore, let us also look at more general knowledge that one of ordinary skill within the art would possess when reviewing Wilson, to assist in interpreting Wilson the way one of ordinary skill within the art would. In other words, what would the knowledge of one of ordinary skill within the art be as to SAN technology in reviewing Wilson? The patent application as filed provides some instruction in this regard. On page 2 of the patent application as filed, the following is stated with respect to a SAN:

> A SAN is a dedicated, centrally managed, secure information infrastructure which enables any-to-any interconnection of servers and storage systems. SANs allows for connection between storage devices and host machines across greater distances than are possible on a traditional local area network (LAN). SANs enable users to store large volumes of data at remote locations called libraries.

Furthermore, on page 3 of the patent application as filed, it is stated that a fiber-channel "SAN is a fiber-based solution for high-speed storage access" and "there remains an industry need for high-speed host to host connectivity."

Thus, the knowledge that one of ordinary skill within the art possesses as to SAN's is that SAN's are used for connecting hosts to storage systems, and storage systems to one another. At the time the patent application was filed, after the publication date of Wilson, there remained an industry need for high-speed host-to-host connectivity comparable to SAN's. One of ordinary skill within the art, in other words, does not have the knowledge that SAN's can be used for direct host-to-host communication, as opposed to host-to-storage system and storage system-to-storage system communication. Applicant also refers the Examiner in this respect to the cofiled Computer Desktop Encyclopedia entry for SAN, which discusses connecting servers (i.e., hosts) to disk storage (i.e., storage systems), and never discusses SAN's being used to connect servers to servers for communication among the servers directly. That is, Applicant strongly asserts and

submits that a SAN, as understood by one of ordinary skill within the art at the time of filing the present patent application, is for host-to-storage system and storage system-to-storage system communication, and not for host-to-host communication.

Therefore, the reasonable interpretation of the embodiment of FIG. 12 in Wilson, using the knowledge that one of ordinary skill within the art would have in his or her possession, is that the single communication link of the embodiment of FIG. 12 could not be implemented using a SAN. Combining this with Wilson's own pronouncements that the embodiment of FIG. 12 is not to use SAN-type technology where a single communication link is employed for both inter-host communication and inter-storage system communication, and you have the correct interpretation of Wilson. This correction interpretation is that the only embodiment of Wilson that seemingly teaches host-to-host communication over a network that provides for storage system-to-storage system communication – that of FIG. 12 in Wilson – is not to be employed in relation with a SAN. Stated yet another way, at the time the patent application was filed, one of ordinary skill within the art did not have in his or her possession the knowledge that a SAN could be used for direct inter-host communication, without passing through a storage device, as in the claimed invention. Wilson does not add to this, because Wilson says that its embodiment of FIG. 12 is not to be used with SAN-type technology like ESCON links. Therefore, Wilson in view of Latif does not render the claimed invention obvious.

Summing everything up (conclusion)

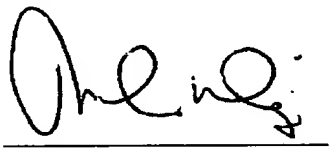
The crux of the invention is thus that a SAN is novelly used for one host to communicate with another host, directly, and not through a storage system. The claimed invention in this regard improves upon the prior art, which utilizes SAN's only for inter-storage system communication and for host-to-storage system communication. Wilson in its FIG. 6 demonstrates conventional prior art thinking in this respect, because it is the only embodiment of Wilson that particularly is described as using SAN-type technology like ESCON links. In FIG. 12, Wilson is providing a different embodiment in which a non-SAN is used to provide for inter-host, inter-storage system, and host-to-storage system communications. There is nothing in Wilson's FIG. 12 to suggest that the single network can be a SAN, and, indeed, Wilson teaches away from using a SAN in its description of FIG. 12, instead stating that non-SAN technology is to be used. Knowledge as to SAN's available to one of ordinary skill within the art at the time of filing the present patent application buttresses this conclusion. Therefore, Wilson in view of Latif does not teach the claimed invention.

Applicant very much hopes that the Examiner agrees with this assessment of the prior art and of Wilson. If the Examiner sees Applicant's point of view, but is still not otherwise convinced, he is asked to call Applicant's representative, Michael Dryja, at the phone number listed below. Applicant's representative can then file a Rule 132 affidavit to provide further evidence that the assessment of SAN prior art and of Wilson noted here is correct. That is, Applicant believes that a proper interpretation of Wilson proves that *prima facie* obviousness has not been established. However, if the Examiner does not agree, then Applicant can further file a Rule 132 affidavit to provide further evidence as to the understanding of SAN technology that is provided here, such that it would be evident that in view of such a prior art understanding of SAN technology as to Wilson in view of Latif, non-obviousness of the claimed invention is established.

Conclusion

Applicants have made a diligent effort to place the pending claims in condition for allowance, and request that they so be allowed. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Mike Dryja, Applicants' Attorney, at 425-427-5094, so that such issues may be resolved as expeditiously as possible. For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,



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